

What is claimed is:

1. An image forming apparatus comprising:

an image carrier constructed to bear a toner image thereon; and

density detection means constructed to detect a density of an image in a predetermined detection region on said image carrier and operative to detect a toner image density of the toner image borne on said image carrier,

wherein a toner image having tone levels progressively increased or decreased along a predetermined direction is formed as a gradation patch image which is subjected to density detection by said density detection means, and tone correction information is defined based on the detection results and then used for tone correction of an input image signal thereby to obtain a tone-corrected image signal, based on which an image is formed, and

wherein said gradation patch image has the tone levels thereof increased or decreased stepwise at a smaller pitch than a width of said detection region with respect to said predetermined direction.

2. An image forming apparatus according to Claim 1, wherein said gradation patch image comprises a plurality of monotone toner images differing from one another in the tone levels and continuously arranged along said predetermined

direction, and wherein said monotone toner image has a smaller width than that of said detection region with respect to said predetermined direction.

3. An image forming apparatus according to Claim 2, wherein said plural monotone toner images each has the same width with respect to said predetermined direction and has a constant tone level difference from a respective adjacent monotone toner image thereto.

4. An image forming apparatus according to Claim 3, wherein the difference of tone level between any pair of adjoining ones of said plural monotone toner images is the minimum practicable level difference for the apparatus.

5. An image forming apparatus comprising:  
an image carrier constructed to bear a toner image thereon; and

density detection means constructed to detect a density of an image in a predetermined detection region on said image carrier and operative to detect a toner image density of the toner image borne on said image carrier,

wherein a toner image having tone levels monotonously and continuously increased or decreased along a predetermined direction is formed as a gradation patch image which is subjected

to density detection by said density detection means, and tone correction information is defined based on the detection results and then used for tone correction of an input image signal thereby to obtain a tone-corrected image signal, based on which an image is formed.

6. An image forming apparatus according to Claim 5, wherein said gradation patch image is monotonously and consistently increased or decreased in the tone level along said predetermined direction.

7. An image forming apparatus according to Claim 1, wherein said density detection means performs the density detection on a plurality of positions in said gradation patch image, the positions shifted from each other along said predetermined direction.

8. An image forming apparatus according to Claim 7, said wherein detection regions individually corresponding to any pair of adjoining ones of the plural positions have at least a respective part thereof in contacting relation or in overlapping relation.

9. An image forming apparatus according to Claim 1, wherein the maximum tone level of said gradation patch image

is the maximum practicable tone level for the apparatus whereas the minimum tone level of said gradation patch image is the minimum practicable tone level for the apparatus.

10. An image forming method for forming an image based on a tone-corrected image signal obtained by tone-correcting an input image signal based on tone correction information,

wherein a gradation patch image progressively increased or decreased in the tone level along a predetermined direction is formed and subjected to density detection means for detection of a toner image density thereof, and then the tone correction information is defined based on the detection results, and

wherein said gradation patch image comprises either an image monotonously and continuously increased or decreased in the tone level along said predetermined direction or an image having the tone levels increased or decreased stepwise along said predetermined direction and at a smaller pitch than a width of a detection region of said density detection means.